

## **Abstract**

### **LEADING EDGE DIFFUSION COOLING OF A TURBINE AIRFOIL FOR A GAS TURBINE ENGINE**

5           A plurality of double rows of orifices sandwiching a plenum formed  
in the wall of the leading edge of an airfoil diffuses the coolant that feeds a  
plurality of columns and rows of grooves formed in the leading edge of the  
airfoil so as to diffuse the coolant and define a film of cooling air. The grooves  
may be aligned or staggered and the orifices, plenums and grooves are sized  
to match the airflow to the heat load along the leading edge to maximize the  
10       use of coolant and enhances engine performance as does the absence of  
material at the leading edge that results from the use of the columns and rows  
of grooves.